

**ABSTRACT OF THE DISCLOSURE**

The invention is directed to polyurethane prepolymers having a reduced amount of unreacted monomeric diisocyanate, particularly diphenylmethane diisocyanate (MDI), prepared by distilling the prepolymer reaction product in the presence of at least one inert solvent whose boiling point is slightly below that of the monomeric diisocyanate; and to high performance cast polyurethane elastomers from the thus obtained prepolymers using diamine and/or diol chain extenders.